

## [5] Diseases Caused By Viral Pathogens

図書名	Fish Diseases
開始ページ	278
終了ページ	322
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## **DISEASES CAUSED BY VIRAL PATHOGENS**

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## **Contents**

1. Freshwater Fish
  2. Marine Fish
  3. Salmon and Trout Viral Diseases
  4. Shrimp Diseases
- Glossary  
Bibliography  
Biographical Sketches

## **Summary**

Viral diseases cause particularly severe damages in aquaculture in the world, mainly due to lack of effective chemotherapeutics and limited numbers of commercially available vaccines. Some of the diseases have spread among wild populations of fish as well as cultured ones, resulting in considerable loss in fisheries and the natural resources. In this section, we selected important viral diseases of fish and shellfish (shrimp), and describe their disease agents, geographical distributions, host ranges, and diagnostic and control methods. These include five diseases (SVC, CCVD, KHVD, HVHN, EHN) in freshwater fish except for warm-water fish, two (RSIVD, VNN) in marine fish except for salmonids, five (IPN, IHN, VHS, OMVD, ISA) in salmon and trout, and six (WSD, YHD, IHNN, TS, WTD, IMN) in penaeid shrimp. Most of the diseases are currently listed by the World Organization for Animal Health (OIE) and thus are of great importance for the

international trade of aquatic animals.

## 1. FRESHWATER FISH

*Motohiko Sano*

### 1.1. Synopsis/Abstract

This section describes the viral diseases affecting warm-water fin-fish in fresh water. Although many viral diseases and the causative viruses have been reported to date, this section focuses on the five most important viral diseases.

### 1.2. Introduction

Fresh water fish form the largest segment of the world aquaculture production and a major part of the catch-fish industry in inland waters. The harvest of farmed warm-water fish is increasing, and consequently, fry production of fish species for aquaculture has also rapidly increased and disease problems have become the largest obstacle in aquaculture operations. Some diseases of cultured fish (e.g. koi herpesvirus disease) have spread to wild populations of fish which pose serious threats to the ecosystem. .

Wolf (1988) described 59 fish viruses, and, subsequently, the number of fish viruses reported continues to increase so far. Viruses of warm-fresh water fish of major importance are shown in Table 1.1 (Sano et al, 2011). This section focuses on diseases caused by 5 of the viruses in the table: spring viremia of carp, channel catfish virus disease, koi herpesvirus disease, herpesviral hematopoietic necrosis and epizootic hematopoietic necrosis. These diseases are transboundary aquatic animal diseases, of international concern due to their significance in the international trade of aquatic animals. Most of the diseases in this section are currently listed by the World Organisation for Animal Health (OIE) (Aquatic Animal Health Code 2012).

<b>Virus</b>	<b>Taxonomy (Family)</b>	<b>Main Host</b>
<b>DNA Virus</b>		
Carp herpesvirus (CHV) (=CyHV-1)	Alloherpesviridae	Carp ( <i>Cyprinus carpio</i> )
Goldfish hematopietic necrosis virus (GFHNV) (=CyHV-2)	Alloherpesviridae	Goldfish ( <i>Carassius auratus</i> )
Koi herpesvirus (KHV) (=CyHV-3)	Alloherpesviridae	Carp
Channel catfish virus (CCV) (=IcHV-1)	Alloherpesviridae	Channel catfish ( <i>Ictalurus punctatus</i> )
Ictalurus melas herpesvirus (IcmHV) (=IcHV-2)	Alloherpesviridae	Black bullhead ( <i>Ameiurus melas</i> )
<i>Herpesvirus anguillae</i> (HVA) (AngHV-1)	Alloherpesviridae	Japanese eel ( <i>Anguilla japonica</i> ), European
White sturgeon herpesvirus 1 (WSHV-1) (=AciHV-1)	Alloherpesviridae	White sturgeon ( <i>Acipenser transmontanus</i> )
White sturgeon herpesvirus 2 (WSHV-2) (=AciHV-2)	Alloherpesviridae	White sturgeon